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REMARKS

Applicants note that because claims 24 and 27 depend, either directly or indirectly, on withdrawn claim 14, claims 24 and 27 are withdrawn from consideration. The status indicator for these claims is set forth in the present amendment as "(withdrawn)".

The specification and independent claims have been amended to delete the "steady state" language and thereby obviate the rejection under 35 USC §112, paragraph 1, as well as the objection to the specification and claims. Entry of the amendment is in order because it overcomes the foregoing rejection and objection. In addition, deletion of the "steady state" requirement does not affect the basis for the art rejection. Consequently, the amendment does not require a new search or consideration of new issues.

Applicants traverse the rejection of claims 1 and 17 under 35 USC §103(a) as being unpatentable over Bhardwaj et al. (U.S. Patent 6,051,503) in view of Howald et al. (WO 00/58992). The independent claims are limited to etching a workpiece in a vacuum plasma processor chamber wherein a gas species is converted into an AC etchant plasma that is continuously applied to the workpiece while a feature of the workpiece is being formed. In contrast, every embodiment of the Bhardwaj et al. reference discloses forming a trench by alternately ion etching and depositing passivation layer by the chemical vapor deposition. In this regard, see the Abstract, line 4, and col. 1, lines 41-44. In addition, Figs. 6(a), 6(b), 6(c), 6(d) and col. 5, line 60, indicate there is alternate depositing and etching of material while coil power is continuous and unchanging; Figs. 6(a), 6(b), 6(c) and 6(e), and col. 5, line 61, indicate there is alternate depositing and etching, while coil power is switched and Figs. 6(a), 6(b), 6(c) and 6(f), and col. 5, line 57 through col. 6, line 7, indicate there is alternate depositing and etching while

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bias power is varied or off.

The first three waveforms of Fig. 7 that correspond to Fig. 6 (col. 3, line 6) also indicate alternate deposition and etching that occur under differing coil power and bias power scenarios. Fig. 9(ii) discloses increasing coil or r.f. bias power in a ramped manner by using alternate deposition and etching steps; see col. 6, lines 43-67 and col. 9, line 40-col. 10, line 3, particularly col. 9, lines 46-47, lines 53 and 54, that says the cycle changes from deposition to etch.

Based on the foregoing, Bhardwaj et al. does not disclose the requirement of independent method claim 1 for "converting a gas species into an AC etchant plasma that is continuously applied to the workpiece while a feature is being formed" or the similar limitations of claim 17 or claim 14 (that does not disclose an invention that is separate and distinct from claims 1 and 17).

In response to the comment in the Office Action that the word features "can either include the entire trench or just a portion of the trench which is rounded," Bhardwaj et al. has no disclosure of a trench or any rounded portion of a trench or any feature being formed by continuously applying an etchant to the workpiece. The entire focus of Bhardwaj et al. is on alternate deposition and etching to form features.

The Office Action also fails to consider the features of claims 2 and 18, as well as withdrawn claim 16, that indicate the gradual power changes of claims 1 and 17 occur while there is no change in the species, the pressure or the flow rate. These limitations are not disclosed by Bhardwaj et al. Bhardwaj et al. changes species to obtain alternate etching and deposition and changes pressure as power is changed; see col. 6, lines 43-66 and col. 9, lines 40-56 and col. 9, line 65-col. 10, line 3.

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The Office Action also ignores the requirement of claims 8 and 9 that indicate a rounded corner and a trench that include the feature of claim 1 is formed by the species being ionized into a plasma that etches the material as a result of the continuous application of the plasma to the workpiece. The Examiner is requested to indicate where Bhardwaj et al. discloses such steps. Applicants note that claims 8 and 9 define specific features that are produced by the continuous power changes. Thus, the previously quoted comment in the Office Action is not applicable to claims 8 and 9.

Applicant cannot agree that the time and power limitations of claims 12, 13, 26-28, 30 and 31 are obvious as a result of Bhardwaj et al. Claims 12 and 13 respectively indicate the steps are no more than one second and above 1 millisecond. Claims 26-28 and 31 indicate the steps have durations in the range of one millisecond to one second, while claim 30 limits the step to 1 second.

Bhardwaj et al. indicates the steps have durations between 2-15 seconds and that 4-6 seconds are preferred; col. 6, lines 53, 54, 61. Bhardwaj et al. has no disclosure of the amplitude of the power steps of Fig. 9(ii).

Applicants achieve very precise control by using these durations and do not need to resort the cumbersome alternate deposition and etching steps that Bhardwaj et al. employs. Page 13, lines 15 and 16, of the present application states "steps longer than one second will not usually provide the desired rounding effect." Hence, the limitations of claims 12, 13, 26-28, 30 and 31 are not made obvious by Bhardwaj et al.

The Howald reference does not cure the foregoing deficiencies of Bhardwaj et al.

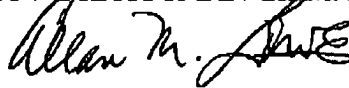
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In view of the foregoing amendments and remarks, allowance is in order.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 07-1337 and please credit any excess fees to such deposit account.

Respectfully submitted,

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